

# PATENT SPECIFICATION

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## (54) SYNTHETIC SMOKING PRODUCT

(71) We, GALLAHER LIMITED, a British company, of 138 York Street, Belfast, Northern Ireland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

It is generally recognised that the difficulties in assessing any health hazards which may be associated with cigarette smoking arise from the variety and complexity of the combustion products in the smoke which is inhaled. Many of the combustion products are difficult if not impossible to isolate and are present in such small quantities that their pharmacological activity cannot be properly determined. Various approaches have been used in the past for controlling the combustion products which are inhaled, either by replacing natural tobacco with a substitute material of known composition, or by means of filter plugs through which the smoke is drawn.

We have now conceived a fundamentally new approach in which a smoking material is composed of a matrix of a simple fuel which has mechanical properties, that is flexibility and self-cohesion, and, when made up into cigarette rod form, hardness and porosity, similar to those of natural tobacco, the fuel being impregnated or otherwise associated with volatile solid or liquid constituents which are capable of distilling or subliming into a smoke stream without chemical change and thus providing smoke to be inhaled upon burning of the fuel.

By a simple fuel is meant a material which burns in atmospheric air to produce preferably known simple combustion products of well understood toxicology. The most useful fuel is carbon which burns to simple gaseous oxides having a well understood chemistry and with no unknown health risks. However the use of carbon in the form of charcoal, as has previously been proposed for use as a fuel in analogous fields is unsatisfactory because the carbon fuel in that form is incapable of being handled on conventional cigarette making machinery and other tobacco handling equipment.

We find that the criteria can be satisfied by a fuel comprising a self coherent mass of combustible flexible fibres each of which has a cross sectional dimension of between 5 and 50 microns and which are made of a carbonaceous material containing at least 80% carbon by weight, which material is the product of the controlled pyrolysis of a cellulose-based fibrous material containing only carbon, hydrogen, and oxygen.

The invention also includes a method of preparing a combustible fuel for smoking by human beings, the method comprising providing a self-coherent mass of flexible cellulose-based fibres containing only carbon, hydrogen and oxygen, and subjecting the mass to a controlled pyrolysis until the fibrous mass contains at least 80% carbon by weight, and the fibres have a cross-sectional dimension between 5 and 50 microns.

The basically fibrous nature of the carbonaceous fuel, of which the fibres may have a cross sectional dimension between 5 micron and 50 micron, contributes to the flexibility and mechanical strength of the fuel and to the ability of the fuel particles to hold together without the need for binders or other adhesive aids. The fibres may be additionally crimped or intertwined to further improve the self-cohesion of the material. A matrix of the fuel can be handled on mechanical devices for cigarette making and can be easily formed into cigarettes with an acceptable pressure drop for smoking.

For instance, we have found that fuels made from coarse fibres or mixtures including coarse fibres such as pyrolysed coir or sisal with cross-sectional dimensions up to 300 microns were brittle and not flexible and did not cohere easily together. During handling and transformation of such material to a cigarette form many of these fibres broke and dust and fine particles were formed.

However, for fine fibres such as pyrolysed cotton or ramie with cross sectional dimensions from 5 to 20 microns, the fibres were flexible and self-coherent and could be transformed into an acceptable cigarette form without significant breakage.

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